Proposal to apply **Adgreencoat**®

Effectiveness of Heat Shield Paint
At Warehouse in Singapore.

NCK.GP

# Simulation for Effectiveness of Heat Shield Paint

The heat shield paint is one of the most effective way to reduce the radiant heat restraint in the inside of the building.

You can expect to improve the work environment by reducing the temperature inside of the building. We prove the heat shield paint, Adgreencoat, has the own-distinctive functionality, such as high solar reflective and heat exhaust, which can effectively release the heat from the sun.

Notes

1. As the simulation results, it significantly reduces heat load from the roof (radiant heat) by the heat shield paint, Adgreencoat. Also it is to contribute greatly reducing the room temperature.

2. In consideration of radiant heat and the humidity, the sense of summer heat is greatly reduced. In the state of no air conditioning, I can expect a reduction of about 4 ℃ indoor temperature. (See attachment)

Reduce the radiant heat in the inside of the warehouse.

"Radiant heat"
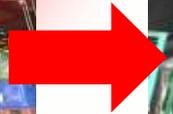
※STEEL PLATE ROOF STRUCTURE　（*Proof level by the maker）

【Before 56℃】　　　　　　　　　　　【After 36℃】

* The photograph is an image

(Please refer to an attached sheet)

Warehouse 1,000㎡ The simulation results	
Indoor (the upper part) suppression effect at a peak period	**14.2℃**
Indoor (the lower part) suppression effect at a peak period	**4℃**

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項目	無塗装	（遮熱塗装）アドグリーンコート®	備 考
Sq. measure（㎡）	1,010		Target roof sq. measure（＊calculated by a drawing）
coefficient of subgrade reaction（with radiant heat consideration）	4.230	4.221	Calculated on the basis of the original data which was taken into account by the radiant heat from roof structure.
Outside Roof temp（℃）（expected）	56	36	Paint maker investigation（reflect the temperature difference due to the demonstrated value）
Indoor temperture（℃）	36		Inside temperature(expected)
Heat penetration calorific value (kcal/h)	93,991	8,526	Difference of heat intrusion from the roof surface
Calorific value reduction (kcal/h)	−	85,464	Heat transfer loss (no paint) - Heat transfer loss（after paint application / construction）
The Simulation Result			
Indoor (the upper part) suppression effect at a peak period		14.2℃	*2m range to upper part
Indoor (the lower part) suppression effect at a peak period		4℃	*2m range to lower part

 Note <math formula>
<specific heat at constant pressure>1.006J/g·K
<density> 1.24×10-3g/cm3
<mass> density × cubic volume
Q(cal. value)=m【g】mass×c【J/g·K】specific heat×⊿T【K】temp difference
⊿T(temp difference)=Q（cal. value）÷（c (specific heat) ×m (mass)）
Convert reduce thermal units to Joule

<Conditions>
*def.as more than 30℃
・Coefficient of subgrade reaction（K value）/Calculated in consideration of the radiant heat by the roof structure
・Outside Roof Temp /Paint maker investigation(reflect the temperature difference due to the demonstrated value)
・No inside heat resource factors expected.
・Target roof :1,010㎡ （＊remove eaves）
・cubic content : 7,272㎡
・Thermal conductivity :Steel sheet 0.8t

※Each value are changeable, conditional on heat insulated structure, air conditioner efficiency, human factor, heat exhausting equipment, etc. There is the case that is different from the real-valued simulation. Please assume it a reference level.
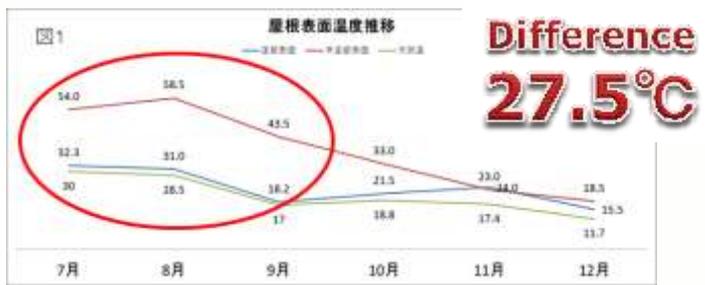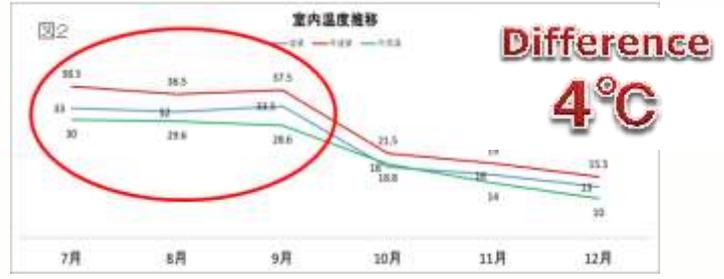
Temperature suppression effect
Other companies example

●House maker factory（Japan） Roof：Galvalume ＜27,000㎡＞
※Measurement period：From July,2012 to December.
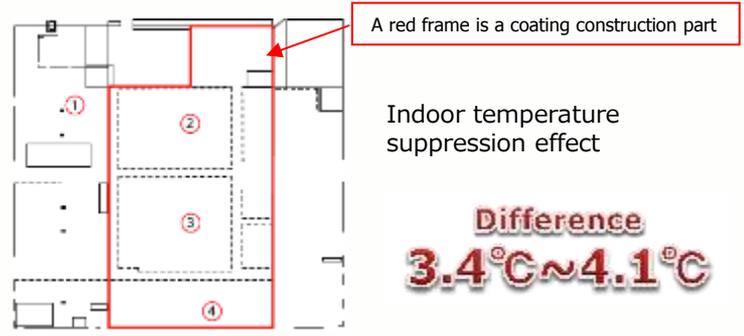

●Suppression effect of the roof temperature

Difference 27.5℃

●Indoor temperature suppression effect

Difference 4℃

●Wood system material factory（Japan）
Roof：Galvalume ＜10,584㎡＞

・to compare (am9:00 am12:00 pm3:00)
・Last year（01-Jul-2011～31-Aug-2011 *measurement of 123)
・After the painting（17-Jul-2012～31-Aug-2012 *measurement of 75)
・I compare the temperature of (① no painting) for the standard value

A red frame is a coating construction part

Indoor temperature suppression effect

Difference 3.4℃～4.1℃

＜Non coating more than 30℃＞

Measurement point	Before	After	Difference
②	＋0.6℃	-2.8℃	3.4℃
③	＋1.2℃	-2.9℃	4.1℃
④	＋2.0℃	-2.0℃	4.0℃